Roland GR Connection
A Roland Users Group

AXE FACTS

The INFO Source for GR Users Volume III / No. 3

What's the deal with Delay?

Delay can be defined as the amount of time it takes between the plucking of a string and the synthesizer sound reaching your eardrums. In an acoustic world, when a guitar string is plucked the sound appears to respond instantly because guitarists actually feel the string vibrate under their fingers. Also, a plucked string has a percussive quality so the attack is very quick.

The delay normally associated with guitar synthesizers comes from three basic areas: the time it takes the pitch of the note to be determined, the time it takes the GR synthesizer to analyze this pitch and convert it into a MIDI note message and finally the time it takes for the synthesizer to respond to this MIDI message. When you add up time from all three of these processes you can really begin to tell that the notes are being slightly delayed.

The GRs utilize a pitch-to-MIDI method which means the note is determined by the frequency of the vibrating string. Each note vibrates at a specific speed which is measured in Hertz or cycles per second and high notes vibrate more quickly than low notes. For example, the open A string vibrates 220 times per second while the A one octave higher vibrates 440 times per second. The GR guitar synthesizers take one full vibration cycle to determine what pitch is being played. So an open A string will take 4.5 milliseconds before the converter can establish the pitch of a plucked note.

The next stage where delay occurs is in the MIDI conversion process. It takes a GR three milliseconds to convert the pitch messages to a form that the internal synthesizer can understand. It takes even longer to change this signal into a MIDI message. Because the GR has its own proprietary messages when triggering its own sound source, there is less delay than when using the MIDI out to trigger external synthesizers and sequencers.

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Get Effected!

with the

BOSS ME-8

Guitar Multiple Effects

Multiply your expressive possibilities with BOSS's latest multiple effects unit.

The ME-8 Guitar Multiple Effects is BOSS's latest pedal board style guitar multi-effects unit. Combining impressive proprietary technology with all of the most popular BOSS effects, the new ME-8 is destined to become a foot-stompin' favorite. Within its 100 patches (50 User and 50 Preset) 11 of the 23 effects can be used simultaneously. This massive library of effects includes the basic types every guitarist needs: reverb, delay, chorus, phaser, flanger, compressor, EQ, etc. Plus, it has new cutting edge effects, like the two-voice intelligent harmonist and the humanizer which emulates the human voice, along with vintage effects like tremolo/pan, vibrato, feedback, slow attack and ring modulation, making the ME-8 more flexible and powerful than many of today's most popular rack units that cost twice as much or more.

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GR USERS UNITE

Are you interested in networking with other guitar synth users across the country? We'd like to help you. The GR Connection is a forum for you to ask questions and offer user tips based on your own experience with guitar synthesis. At Roland, we speak with hundreds of GR users each month who could benefit from your ideas and might be able to help you improve your own. Feel free to send any ideas, articles, tips, feedback, etc. to:

Roland Corporation U.S.
ATTN. GR Connection
7200 Dominion Circle
Los Angeles, CA 90040

GR-09 Patch

Analog Pad: The following patch settings are ideal for creating a layered patch with two tones per string. The two tones selected for this layer are JP STRINGS and SWEEP PAD. Creating a layered patch using a different combination of tones is simply a matter of replacing the MAIN TONE and the SUB TONE with new tones. Also note that the bottom two strings are programmed to play one octave lower, bend is set to CHROMATIC which keeps the patch perfectly in tune and the expression pedal is assigned to control the cutoff frequency.

CHROMATIC/NORMAL CHROM

PATCH EDIT 1

MAIN TONE#	248	JP Strings3
ATTACK	00	No Change
RELEASE	8	Some Release
BRIGHTNESS	0	No Change
* LAYER		Detuned
All Strings	X	XXXX
String 1	;	Detune
String 2	;	Detune
String 3	,	Detune
String 4	,	Detune
String 5	;	Dual
String 6	;	Dual
* NOTE SHIFT		Bass Octave Down
All Strings	X	XXXX
String 1	0	Normal
String 2	0	Normal
String 3	0	Normal
String 4	0	Normal
String 5	-12	Octave Down
String 6	-12	Octave Down
TONE BALANCE	0	Equal Balance
PATCH LEVEL	100	Full Volume

PATCH EDIT

SUB TONE#	296	Square Sweep
REVERB TYPE	Pd5	Pan Delay 5
REVERB LEVEL	50	Equal Mix
CHORUS TYPE	Fl2	Flanger 2
PLAY FEEL	SFt.	Soft Picking
EDIT TARGET	DUL	Dual (Both Tones)
PITCH SHIFT	Dn5	Fast Octave Down
EXP PEDAL	3	CutOff

GR-1 Patch

[MOOGBASS] Created By Scott Summers

STRING MODE CHANGE [1ST] and [2ND]
REVERB/CHORUS BOTH [ON]
ORIGINAL TONE 1ST [56 PDL BASS]
ORIGINAL TONE 2ND [56 PDL BASS]

20: [P-NAME]
[MOOGBASS]

21: [P-COMMON]
[CRMT OFF]
[SENS3 D6]
[1/2 LAYR]
[V-TH 0]
[FAT ON]
[2-FX ON]
[2-HD ON]
[LEVL 100]
[L-BAL 0]

22: [1ST TONE]
VALUES [0] except:
[DTUN - 8]
[PAN <63]
[COFF 4]
[RESO 40]

23: [2ND TONE]
VALUES [0] except:
[DTUN 8]
[PAN 63>]
[COFF 4]
[RESO 40]

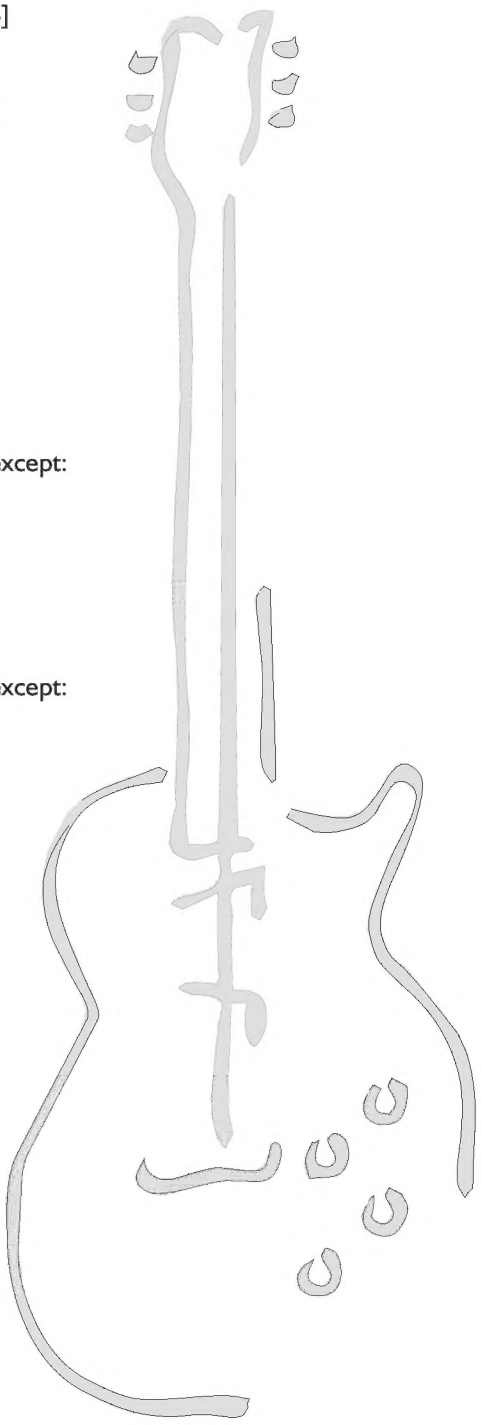
24: [1STSHIFT] 1
[ALL 0]

25: [2NDSHIFT]
[ALL 0]

26: [PG CHANG]
[S-ALL ??]

27: [REVERB]
[TYPE RM2]
[D-FB 0]
[TIME 50]
[LEVL 50]

28: [CHORUS]
[TYPE FLN]
[FBAK 84]
[C->R 0]
[LEVL 64]
[DPTH 16]
[RATE 2]



Making the Connection

This section is dedicated to integrating a Roland guitar synthesizer with additional MIDI devices including sound modules, keyboards and effects processors. The best way to integrate the system depends upon the equipment available, so here are some basic guidelines to follow.

Connecting a GR to MIDI and signal processing devices:

1) Use MIDI cables to connect the MIDI Out of the GR into the MIDI In of your first sound module. Take the MIDI Thru of the first sound module and connect it to the MIDI In of the next module or MIDI signal processor. Continue this procedure until you have connected every MIDI device in your GR system.

2) When using a GR to control additional keyboards and/or sound modules in a live performance system, set the GR to Mono mode on MIDI channel 1 and set the bend to 12 half steps. Mono mode assigns each string to a separate MIDI channel and transmits individual bend messages per string. A bend range setting of 12 allows bending and sliding of up to an octave.

3) On the receiving end, the connected synthesizer must be programmed to respond properly to the GR. Assign the slave synth to receive on MIDI channels 1 through 6, and program the bend range setting to +/- 12. (Most Roland keyboards and sound modules feature these programmable capabilities).

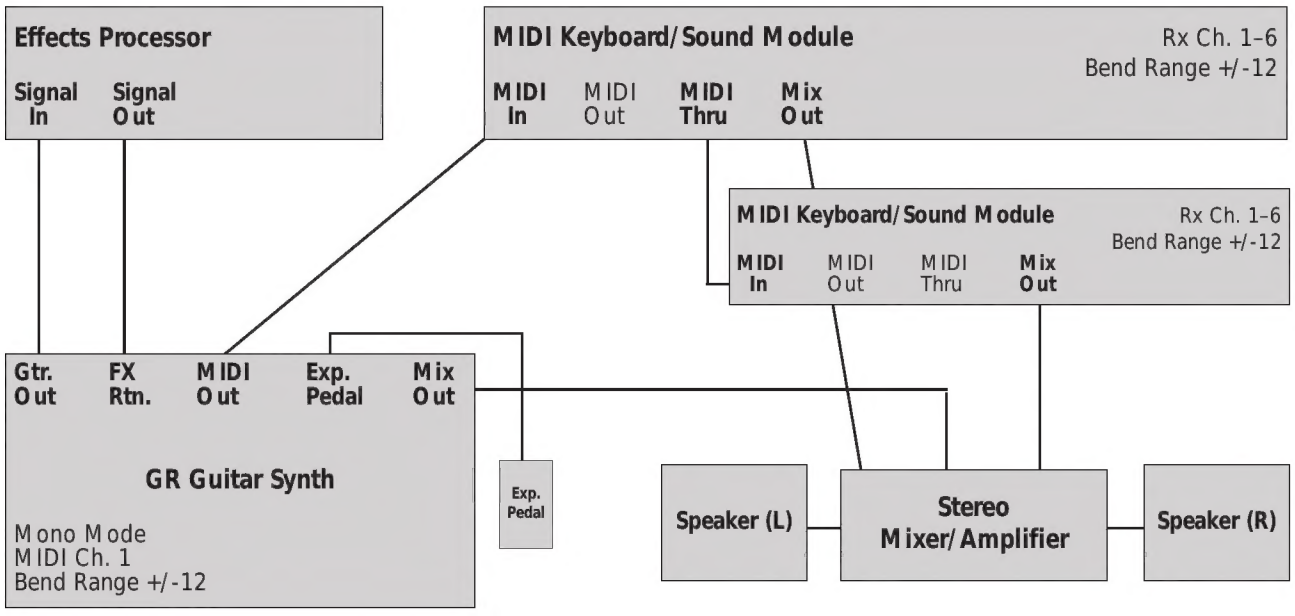
4) In addition to Note and Bend messages, the GR also transmits program change and continuous controller messages. If you have the MIDI channels set correctly, when you change patches on the GR, it transmits program change messages that will change the patches on every item in your GR system.

5) An optional expression pedal can be used to transmit a variety of continuous control messages including Bend, Modulation (CC-1), Volume (CC-7) and General Controller Number One (CC-16). Most synthesizers and MIDI signal processors can be programmed to respond to these messages. Experiment with this powerful real-time control feature.

6) When dealing with the audio connection, start with the synthesizers. Connect the stereo (mixed) signal outputs on each module into the inputs of a line mixer or guitar amplifier. If you use a line mixer, connect the stereo outputs of the mixer into a stereo power amp which should be wired into a pair of speakers.

7) To layer the guitar signal with the GR synthesizer, connect the Guitar Out of the GR into your guitar effects. You can then route the guitar signal directly into a guitar amp or a line mixer (This will work best if you are using a processor like the GP-100 or SE-70 that features speaker and amp simulation). A third option is to connect the guitar signal into the auxiliary guitar returns on the GR which mix the guitar signal with the synth signal and send them to the mix outs.

In the next issue, we'll cover connecting a GR synth with other synthesizers and a sequencer.



What's the Deal with Delay cont.

The final area where delay occurs is in normal MIDI delay time and the MIDI response time of the synthesizer being triggered by a fretboard controller. Since MIDI is a serial interface (messages flow in a single file line), each message requires approximately one millisecond. If you play a six note chord the last note will be delayed by at least six milliseconds. And this is not factoring velocity and bend messages into the equation.

Also the sound module takes time to analyze the MIDI message and produce a sound. Delay times start at four to eight milliseconds for a single MIDI note message, all the way to 20 and even 30 milliseconds if you layer multiple oscillators and try to play six note chords on six different MIDI channels.

The bottom line is the majority of the delay comes from using MIDI and this is a problem shared by all MIDI musicians including keyboardists and MIDI percussionists. The Roland GR-series synths solve the problem by not using MIDI to trigger the internal sounds, but this is a limitation in its own right. Keyboardists seldom complain because they have always dealt with this delay and they are used to it. When you first play a fretboard controller, this delay will be very apparent. But with time, practice and some minor modifications in your playing technique, you'll become accustomed to the delay and it will no longer be a problem.

BOSS ME-8 Guitar Multi Effects cont.

The analog overdrive/distortion circuit features the five most popular BOSS crunch pedals including classics like the OD-1, Turbo OD-2 and DS-1, along with the new BD-2 Blues Driver and the ever popular MT-2 Metal Zone. A built-in programmable effects loop allows you to incorporate your favorite pedal or the preamp section of your tube amp along with a killer speaker emulator. This will give you a lot of sonic flexibility.

The ME-8 has a dedicated Control pedal which, along with an optional EV-5 Expression Pedal, can be programmed to control a number of realtime parameters per patch. Volume, wah, pitch, vibrato and feedback are some examples of the options available with the ME-8. The control pedal can also be used to turn effects on or off within a patch, to set the delay time by tapping the pedal or to set the rate of the chorus/flange/phase per patch. Optional foot switches can be connected for dedicated control of the tap tempo function, switching to manual mode and turning the chromatic tuner on or off.

To bend or not to bend?

That is the question...

The expressive capabilities of the guitar have always made keyboardists green with envy. Even with bend levers, modulation wheels and key pressure, when it comes to bending notes, adding vibrato at any depth and speed or sliding from note to note, a fretboard blows any keyboard away. Fortunately, GR-series guitar synths use bend messages to accurately reproduce these expressive guitaristic subtleties internally and through MIDI. Unfortunately, there are many problems and limitations to recording this information in a sequencer.

Bend messages are used to bend or slide from one note to another on the same string. This can have a musically pleasing effect but it can also cause problems. Sliding and bending generally cause a massive number of MIDI events to be transmitted and there's no new "note on" message until you retrigger it with your picking hand. An example of where this could cause problems is when you use a notation program. If you bend or slide from C# to D, the C# will appear on the music staff even if you wanted to see it as a D. Also, most sequencers don't quantize bend messages, so they can really mess up the timing of a track.

Bending is possible in Poly mode but only on single note lines. As soon as you play two or more notes at the same time, the guitar controller stops sending bend messages. For a track that features a very guitaristic performance with the whammy bar you will need to be in Mono mode. It may be worth using six MIDI channels for one track.

When recording tracks that don't need pitch bend, turn it off from the GR synth. This is done by setting the bend range to 0 (also called chromatic). With bend off you will get two notes when you slide from C# to D. If you have the sequencer filter out bend messages or delete the bend after the fact, all you will get is the C#. Bend messages also have a tendency to make the track sound out of tune, which may be a desirable effect on a flute sound but probably not so on a marimba.

If you're recording parts that don't feature bending or sliding, turn bend off on the guitar synth. If you're recording bass lines or single note melody lines that have bends and vibrato, be in Poly mode. If you are sliding around the neck with the whammy bar in hand, be in Mono mode.

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